

REMARKS

Claims 1-39 are pending. Claim 22 has been amended.

Rejection of Claims under 35 U.S.C. § 102

Claims 1-3 and 22-23 stand rejected under 35 U.S.C. § 102(b) as being anticipated by Kawashima et al., UK Patent Application 2,308,895 (Kawashima). The applicants respectfully traverse this rejection in part.

Kawashima neither teaches nor suggests a printed circuit board assembly for high-speed optical format data transmission including:

*. . . a heatsink attached to the printed circuit board wherein the heatsink interfaces with a plurality of the electrical and optical components,*

as required by independent claim 1 and generally required by independent claims 22 and 31.

In his Office Action of April 12, 2002, p. 2 no. 2, the Examiner states that Kawashima's heatsink 30 is for "dissipating heat, attached to the printed board wherein the heatsink interface with the electrical and optical components . . . ." The applicants respectfully disagree. Referring to **Figure 6** and pages 9-10 of Kawashima, Kawashima teaches that heatsink 30 is attached to spacer 28 which is attached to the lower surface of substrate 24. Optical wave guide substrate 14 is mounted in a depression 25 in the upper side of substrate 24. Thus, Kawashima neither teaches nor suggests that a heatsink interfaces with a plurality of the electrical and optical components. Kawashima's heatsink 30 does not interface with any of the items the Examiner suggests teach the claimed optical components. Moreover, Kawashima does not teach that his heatsink 30 interface with any of the items the Examiner suggests teach the claimed electrical components.

Accordingly, the applicants respectfully submit that claims 1, 22, and 31 are allowable over Kawashima. Claims 2-9 depend from claim 1 and are allowable for at least this reason. Claims 23-30 depend from claim 22 and are allowable for at least this reason. Claims 32-39 depend from claim 31 and are allowable for at least this reason.

Rejection of Claims under 35 U.S.C. § 103

Claims 4-39 stand rejected under 35 U.S.C. § 103 as being unpatentable over Kawashima in view of Bechtel et al., U.S. Patent No. 5,182,632 (Bechtel). The applicants respectfully traverses these rejections.

Regarding claims 4 and 24, the Examiner states that “Bechtel’s device discloses the heatsink 104 with an opening to embed electrical or electronic components.” Office Action of April 12, 2002, p. 3, no. 3. The applicants respectfully disagree. Referring to column 6 and **Figure 3A** of Bechtel, there is no teaching or suggestion that heatsink **104** includes an “opening to embed . . . components.” Bechtel merely teaches that chips **110A**, **110B**, **110C**, and **110D** are bonded onto the surface of heatsink **104**. Interconnect structure **114** includes apertures **116**, but this interconnect structure is not a heatsink and not part of heat sink **104**.

Additionally, the Examiner makes no attempt to justify the combination of Kawashima and Bechtel and thus the Examiner has failed to establish a *prima facie* case of obviousness. In addition to the claim elements not taught or suggested by the cited references as described above, the Examiner has not shown that there is some suggestion or motivation to combine Kawashima and Bechtel, either in the references themselves or in the knowledge generally available to one of ordinary skill in the art. Neither reference suggests such a combination. Moreover, the applicants respectfully submit that the Examiner has failed to explain what specific understanding or technological principle within the knowledge of one of ordinary skill in the art would have suggested the combination, as required by, for example, *In re Rouffet*, 47 USPQ2d 1453 (Fed. Cir. 1998).

Regarding claims 5, 25, and 26, the applicants note that Bechtel neither teaches nor suggests the limitations of claims 4 and 24 and that chips **110A**, **110B**, **110C**, and **110D** do not suggest the claimed heatsink openings. Additionally, the Examiner makes no attempt to justify the combination of Kawashima and Bechtel and thus the Examiner has failed to establish a *prima facie* case of obviousness as noted above.

Kawashima and Bechtel taken alone or in combination neither teach nor suggest a method for dissipating heat from electrical components and optical components on a printed circuit board, the method including:

... attaching a heatsink member to the printed circuit board so that the heatsink member is in contact with at least a portion of each electrical and optical component that requires cooling,

as required by independent claim 10 and generally required by independent claim 16. Neither reference teaches or suggests that the heatsink member is in contact with at least a portion of each electrical and optical component that requires cooling. Additionally, the Examiner makes no attempt to justify the combination of Kawashima and Bechtel and thus the Examiner has failed to establish a *prima facie* case of obviousness as noted above. Accordingly, the applicants respectfully submit that claims 10 and 16 are allowable over Kawashima and Bechtel taken alone or in combination.

Regarding claims 31-39, the applicants respectfully submit that independent claim 31 is allowable over Kawashima and Bechtel as noted above with respect to the §102 rejection. Additionally, the Examiner makes no attempt to justify the combination of Kawashima and Bechtel and thus the Examiner has failed to establish a *prima facie* case of obviousness. Accordingly, the applicants respectfully submit that claim 31 is allowable over Kawashima and Bechtel taken alone or in combination.

Claims 11-15 depend from claim 10 and are allowable for at least this reason. Claims 17-21 depend from claim 16 and are allowable for at least this reason. Claims 32-39 depend from claim 31 and are allowable for at least this reason.

In view of the amendments and remarks set forth herein, the application is believed to be in condition for allowance and a notice to that effect is solicited. Nonetheless, should any issues remain that might be subject to resolution through a telephonic interview, the examiner is requested to telephone the undersigned.

I hereby certify that this correspondence is being deposited with the United States Postal Service as First Class Mail in an envelope addressed to: Box Non-Fee Amendment, Commissioner for Patents, Washington, D.C. 20231, on July 12, 2002.

  
Attorney for Applicant(s)

7/12/02  
Date of Signature

Respectfully submitted,



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Appendix: Version with Markings to Show Changes Made

In the Claims

Please substitute the following claims for the pending claims with the same number:

- 1           22. (Amended) A device for high-speed optical format data transmission  
2 comprising:  
3           circuit board means for mounting electrical components, optical components, and  
4           a heatsink device;  
5           a plurality of optical components mounted to the circuit board means;  
6           a plurality of electrical components mounted to the circuit board means; and  
7           heatsink means attached to the circuit board means for interfacing with and  
8           dissipating heat from a plurality of the electrical and optical components.